R E P O R T R E S U M E S

ED 020 060 RC 002 406

EDUCATIONAL IMPLICATIONS OF TECHNOLOGICAL CHANGE.

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PUB DATE 8 OCT 67

EDRS PRICE MF-$0.25 HC-$0.32 6P.

DESCRIPTORS- *CHANGE AGENTS, CONTINUOUS LEARNING, *EDUCATIONAL CHANGE, EDUCATIONAL ENVIRONMENT, FARM LABOR PROBLEMS, LABOR FORCE NONPARTICIPANTS, LABOR MARKET, LABOR STANDARDS, MIGRANT EDUCATION, ORGANIZATIONAL CHANGE, RURAL EDUCATION, *SOCIAL CHANGE, SEMISKILLED WORKERS, SMALL SCHOOLS, TECHNOLOGY, *TECHNOLOGICAL ADVANCEMENT, UNSKILLED WORKERS, *WORK ATTITUDES, WORK ENVIRONMENT,

THE RAPID TECHNOLOGICAL CHANGE TAKING PLACE IN THE UNITED STATES IS ESTABLISHING A NEW RELATIONSHIP BETWEEN MAN, EDUCATION, AND WORK IN WHICH IT IS BECOMING NECESSARY FOR ALL MEN TO OBTAIN AN EDUCATION IN ORDER TO WORK. THE IMPLICATIONS FOR EDUCATION CONCERN THE DEVELOPMENT OF THE TALENTS AND ABILITIES OF EVERY PERSON, AND THE DEVELOPMENT OF MANPOWER SKILLS NEEDED TO MEET THE NEW REQUIREMENTS OF A TECHNOLOGICAL AGE. EDUCATION MUST PROVIDE A FUNCTIONAL LITERACY FOR EVERY CHILD AND DEVELOP ATTITUDES TOWARD WORK IN WHICH EDUCATION IS A RESPECTED FACTOR. FOR THOSE STUDENTS WITH SPECIAL NEEDS, EDUCATION MUST DEVELOP SPECIAL PROGRAMS THAT PROVIDE SALEABLE JOB SKILLS. OPPORTUNITIES MUST BE EXTENDED FOR POST-HIGH SCHOOL EDUCATION IN THE CONTINUING REEDUCATION PROCESS NECESSARY FOR ADJUSTMENT TO TECHNOLOGICAL CHANGE. THE NECESSITY OF EXPERIMENTATION, RESEARCH, AND FLEXIBLE APPROACHES TO THE EDUCATION AND OCCUPATIONAL PREPARATION OF ALL PEOPLE ARE DEMANDED BY TECHNOLOGICAL CHANGE. (DK)

ED020060

RECEIVED
JUN 24 1963

FOR RELEASE: 10:00 A.M., Tuesday, October 8, 1963

Annual Convention of the
DEPARTMENT OF RURAL EDUCATION
and its Division of
COUNTY AND INTERMEDIATE UNIT SUPERINTENDENTS

Sheraton-Cadillac Hotel
Detroit, Mich
Oct. 6-9, 1963

SPEAKER: Grant Venn, Consultant to the American Council on Education

TOPIC: Educational Implications of Technological Change

PLACE: Grand Ballroom

Excerpts from Mr. Venn's talk:

Rapid technological change is suddenly presenting a dramatic challenge to man's political, economic, and educational systems. The dimensions of this challenge are greatest as they apply to education because learning is the basis for man's ability to change. The single most important dimension is man's changing role as a worker in a new age of technology. Therefore, the responsibility of education to prepare all youth and adults to meet this new work role has great implications for education.

Technology has created a new relationship between man, education, and work. While a close relationship has been understood for some men and some work, (for example, the professions) technology is pushing us to a point where we must say this relationship holds true for all men and all work. The essential problem for education posed by the new technology is educating all of our people for a new age of technology. This will require a drastic rethinking and reshaping of education in this nation at all levels. Our educational system is in a state of "imbalance." concentrating on the 20 percent who go on to a baccalaureate degree and "hoping" that the other 80 percent will find a portion of the same education useful.

Change and the New Technology

The single word that best describes the new technology is change. This is not a new concept, but what is new is the rate of change. Any student in school today can only be sure of the fact that the world in which he will live will be vastly different than the world in which he received his formal education. That these changes are introduced selectively and the impact is often on an individual or a local community has blinded many people to the fact that they are immediate in importance and national in scope. It has also led us to read of the educational problems of New York City and assume that they do not apply in Crested Butte, Colorado. The growing lag between education and technological change has joined the issue: we are turning out too many young people into a technological age unequipped with the tools they need to live and work effectively. The facts are symptomatic of the problem.

RC 002506

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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* During the school months of 1962 close to 800,000 young people between 16 and 21 were out of school looking for jobs.

* About 1 in 6 of all unemployed who are out of school are 16 to 21 year olds, although this age group makes up only 1 in 14 of the labor force.

* Unemployment among teenage Negro youth is double that of white boys and girls.

* School dropouts suffer most from unemployment.

* Twenty-six million boys and girls will leave school and seek jobs during the 1960's, 40 percent more than in the 1950's.

* If the current rate of youth unemployment persists as youth population increases, by 1970 the number of unemployed youth will be close to 1½ million.

* Only about 1 in 10 now living on farms can expect to make an adequate living in agriculture.

* In the 1960's employment needs for unskilled workers will not increase, farm workers will drop 20 percent. Jobs for professional and technical workers will rise about 40 percent and sales, managerial and proprietors will increase 20 percent.

* The average professional or technical worker now has 4 or more years of college, clerical workers have more than a high school education. 1/

These serious conditions are due to the application of automation and technology to the world of work and a failure to educate people to meet these changes.

The Change in Work

As the industrial revolution shifted work activity from the physical to the manipulative, the technological explosion has shifted the emphasis from the manipulative to the mental. Inevitably work activities demand higher levels of education and more specialized knowledge and skills. This shift from manual to mental work functions has been occurring for a long time and is now accelerating changes in the occupational patterns of the labor force.

For example, in 1900 white collar workers made up 17.6 percent of the labor force, in 1960 43.1 percent and by 1975 are expected to be 48.7 percent. Blue collar workers in 1900 represented 35.8 percent of the work force, in 1960, 36.6 percent and by 1975 should be 33.3 percent. Service workers in 1900 were 9.0 percent of the workers, in 1960, 12.5 percent and are estimated at 14.3 percent in 1975. Amazingly, farm workers in 1900 represented 37.6 percent of the labor force

1/ Taken from The Challenge of Jobless Youth, United States Department of Labor, Washington, D. C., U. S Government Printing Office, 1963, pg. 2.

and in 1960 were only 8 1 percent and by 1975 are expected to decrease to 4 5 percent of the workers in America.* Such is the nature and scope of change in the kind of work most people do.

For centuries man has had to work to provide the shelter, food and warmth he needed to live. The amount of goods he could produce and his physical output was the measure of success; the national heroes were Paul Bunyan and John Henry and idle hands were the devil's helper. This is not the case today. In place of physical work technology has substituted the job. A man's job is now his significant status-conferring symbol. Every individual today, as yesterday however, still must feel necessary, need to achieve, to contribute, and to have a stable concept of his role in society. Today the job is recognition of his acceptance by society. A man without a job is lost.

As serious as unemployment is, it has tended to obscure another problem -- underemployment. It is estimated that there are 4 million unfilled jobs in the nation today. These jobs are unfilled because we have thousands of able men and women undereducated and unprepared for highly skilled, technical jobs. The nation has thousands working at jobs which do not challenge their abilities or aspirations. For too long education has assumed that the best preparation for everyone was the longest possible immersion in a single pattern of education geared to the transition from one level of education to the next culminating in the baccalaureate degree.

There is no question that everyone needs more education, rather the question is whether the single track approach for everyone is the best way for everyone. At this time the facts indicate that the one track approach has not been successful in getting many good students to obtain additional education For too many young people there have been few opportunities for post-high school education other than education for the baccalaureate degree. For many, economic and social conditions have made this impossible.

As serious as these problems are for youth, technology has also created tragic problems for adults already in the labor market. Job displacement, dislocation, and upgrading leave thousands unable to find work. Education and training appear to be the only way such individuals can find a new place in society as workers and consumers. The development of specific job skills, and for many, gaining functional literacy so they may learn occupational skills are real problems

This brief presentation of dislocations caused by technological change in the world of work has major implications for education Time does not allow me to develop changes occurring in the increase of free time which may become available to many people. Nor can the background be presented regarding the matters of value changes and psychological and social pressures that impinge on us all. Since most Americans will work during the major portion of their lifetime (including half of the women) the relationship between man, education, and work becomes fundamental to educational change.

* Computed from Historical Statistics of the United States, Colonial Times to 1957, U. S. Bureau of the Census, Washington, D. C., 1960, pp. 75-8. Also Manpower Report of the President, Transmitted to Congress, March, 1963, pg. 143

The implications for education concern the development of the talents and abilities of every person and the development of manpower skills needed to meet the new requirements of a technological age.

First, Every child must gain functional literacy while in school. This concept is not new but it is obvious that any individual who cannot read, write or compute cannot function effectively in a technological age. If a child cannot learn these basic tool skills in the elementary grades then they must be taught in the high schools This is the basic problem to the present trend which could mean 7½ to 8 million school dropouts in the next ten years. How this is to be accomplished cannot be discussed here but the fact remains that the functional illiterate has little hope for the future and the educational system of the nation must solve this problem. No individual can solve his problem nor can the nation secure the manpower needed unless the schools achieve this goal. The margin for educational error or failure has disappeared

Second, A new attitude toward work and a new relationship between education and the work world must be developed. Education for work must become a respected and proper responsibility for all levels of education and every educator. Too often the teacher or the school has given up on the student when he is not advised to follow the college preparatory route. The single goal, single route structure must give way to a multi-program, flexible approach geared to the students enrolled. Occupational education must become an integral part of total education Quality for all can no longer be defined in terms of every person meeting requirements of one curriculum Quality cannot be "mass" education.

Third, Special programs must be developed for youth with special needs. These youth can no longer be shunted aside by simply allowing them to drop out of school. Programs must be initiated which will continue to develop tool skills and offer vocational preparation at an early age so they have saleable job skills when they leave school. It means a broad range of vocational offerings in occupations not now available in present vocational programs. It will require some of the best teachers working with these students.

Fourth, A vast expansion of post-high school education opportunities is necessary. In the immediate future it appears that ¼ of the nation's youth will need to complete a baccalaureate degree and an additional ½ of all youth will need one to three years of post-high school education. The greatest expansion will be needed in vocational and technical education opportunities in comprehensive institutions of the two-year college type Therefore, 3/4 of the youth in the nation will need post-high school education, a majority of which will be in programs geared to entry job preparation in broad occupational fields The continuation of study in general education and areas of related special knowledge calls for a comprehensive type institution

Fifth, Continuing education must become a major purpose and function of education. This has been necessary for a long time in professional fields. No professional person can "keep up" if he does not continue to learn. Technology has now made this necessary for everyone. There is no longer such thing as terminal education. Education is going to have to provide continuing education opportunities to youth and adults in the skilled, technical, and semi-professional fields, at all levels high school, two-year college, and college and university.

These programs must be different from programs offered for youth in school. They must be specifically planned for those in need of more general education, special knowledge, and new occupational skills Continuing education must become an accepted normal activity in everyone's life and a major function of high schools and post-high school institutions.

Sixth, Local school systems and educational institutions must develop programs and services based on the national nature of change. Technology has so drastically changed time and distance that the nation is smaller than many counties were 50 years ago. The boy or girl in Montana needs the same educational and occupation opportunities as the youth in New York. Local school systems which do not have the funds nor the students to provide special programs and services will have to join forces. Post-high school education for 75 percent of our youth must be available regardless of financial ability or place of residence. The movement of young people to places where jobs are available must be encouraged and assisted. New educational programs responsive to technological change may be unrelated to the local community but they will not be unrelated to the future of the local boy or girl.

Seventh, Today the major responsibility for individual selection of proper educational programs and occupational preparation rests with education. In a technological age sound occupational choice and selection of educational programs is made in direct ratio to information and guidance available to the individual and the breadth of educational opportunities available. Society today provides few chances for youth to learn about occupations and no knowledge of the developing jobs resulting from technology. Guidance for occupational choice must begin in the intermediate grades and continue until the individual is placed in an entry job. The choice of educational preparation and occupational choice cannot be left to chance. Simple continuation in school in a single track approach is no longer adequate. Local school systems should accept guidance responsibility for those youth not in school as well.

Eighth, Education must accept the responsibility of entry job placement or educational re-assignment for every student. Getting a job today or going on for more education is truly based on what one knows, not who one knows Transition from school to work becomes vastly more complex and difficult. At the present time, as Dr. James B. Conant says, "unemployment of youth is nobody's affair." This responsibility must include the school leaver as well as the graduate. No agency in society is as familiar with the young as the school or college and the same kind of placement assistance available for the professional must be available to those in other occupations and lower educational levels. The establishment of a continuing relationship between the school and the individual is necessary to the continuing educational development of every person.

The educational implication of technological change, then, impose greater responsibilities on the educational community. In addition to the implications previously discussed technology indicates the necessity of equalizing educational opportunity and quality among the states and within areas of the state by up-grading those schools which cannot provide the necessary educational scope and quality. It implies continuing consolidation of smaller school districts and greater cooperative efforts among schools to provide adequate occupational education and special services. Technological changes also demand continuous and cooperative planning among the various levels of education and the development of long range plans to meet the educational needs of the state and of the national

needs for educated manpower. The necessity of experimentation, research and flexible approaches to the education and occupational preparation of all people are demanded by technological change.

Grave problems are facing this nation -- a slowdown in economic growth, rising unemployment, increasing racial tension, growing juvenile delinquency, more people on public welfare, chronically depressed areas in the nation, rising job displacement by technology, an exploding ratio of youth to total population, and a growing disparity of educational opportunity.

At the root of each of these problems is a lack of education which prepares the individual for a new world of work and a new technological society.

At a time when gross national product has reached its highest peak, when total individual income is at the highest point in history, we have over 5 percent of our labor force unproductive and a burden on society. Equally, as serious if not more so, are the thousands of individuals undereducated and working at jobs which do not challenge their abilities or talents, leading to individual and national waste.

The human being, regardless of race, intelligence, or place of birth is the greatest resource this nation or any nation can enjoy. The full development of this resource must become the major effort of this society. The large number of youth in our schools and colleges are the hope of the future, not the burden of the present. They represent an opportunity to invest in the only resource which in the long run will bring the promise of America to everyone. Each time this resource is wasted, to whatever degree, it represents a loss to every citizen and to the nation.

The degree to which any individual is unable to find an effective role as a worker and as a consumer in our society is an evidence of failure by the society. Part of each of these failures must be credited to the educational systems.

Because many of our youth and adults are not able to participate effectively in the society due to lack of education or cannot find work because they do not have the necessary skills, we must ask if the educational system is meeting the challenge and the opportunity.

This is not to say that education is the only solution to the problems the nation faces; it is to say that without education the individual, who must solve these problems will make little progress. Education must come into its own in a technological age; its responsibilities and opportunities are greater than ever.